

**Naval Surface Warfare Center Indian Head Division  
FY01 Technology Transfer Business Plan  
December 2002**

**1.0 Laboratory Mission**

The mission of NSCW IHDIV's Technology Transfer Program is to promote and facilitate the timely movement of IHDIV expertise and technologies into the U.S. economy to enhance competitiveness while also supporting the laboratory's defense mission.

**2.0 Overview**

**2.1 Laboratory Description**

The laboratories, personnel, and facilities at the Naval Sea Systems Command, Indian Head, are national assets available for use beyond the scope of naval research and development. Through Technology Transfer, advanced technologies developed for military applications are introduced to the commercial marketplace or leveraged for important public purposes.

On the 3,500-acre Indian Head peninsula in Southern Maryland, civilian and military teams engage in energetics research and development, manufacturing technology, engineering, testing, and fleet support. A robust technology transfer program brings our laboratories, facilities, and technical experts into partnership with private businesses, academia, scientific establishments, and state and local governments. The purpose of these collaborations is to make available Navy-developed technology to support business and industry, create jobs, solve local and regional problems, increase productivity, and strengthen the U.S. economy.

**2.2 Year in Review**

▪ **Major Success Stories from Past Year**

Dr. J. Scott Deiter received a letter of appreciation for his outstanding efforts in support of the intellectual property conference, "From Invention to Products: Gearing Your Intellectual Property for the Market," which was held August 15-16, 2002 at the Naval Undersea Warfare Center Division, Newport, Rhode Island.

As the Director for Technology Transfer at the Federal Laboratory Consortium in Indian, Maryland, Dr. Deiter served as a panelist at the SBIR/STTR Commercialization Workshop: "Commercialization Plan, Commercialization and the Phase III Process" sponsored by Virginia's Center for Innovative Technology, the University of Virginia Health System, and the Virginia Commonwealth University. This workshop was

held in the Richmond Marriott Hotel on September 18, 2002. Attendees learned how to commercialize their products or processes and how to be successful with any of the ten agencies that participated in Phase I & II competition. Dr. Deiter was on the agenda as a facilitator to discuss how to build successful partnerships.

IHDIV participated in Pacific 2002, an international Maritime and Naval Exposition, held in January 2002 in Sydney, Australia. Many major players in the international community, including key defense and naval personnel, and a host of diplomatic, trade and technical delegates attended for the purpose of learning about the latest products and technologies available on the market. As a result of marketing numerous patented inventions at this Exhibition, several licenses for non-toxic airbags and smokeless pyrotechnics are under negotiation with IHDIV.

Under the direction of Dr. J. Scott Deiter, the NSWC IHDIV ORTA Representative, major efforts were made to market and license laboratory technologies. The following are examples:

In FY01, a partially exclusive patent license was executed between IHDIV and Wickford Technologies, Baltimore, Maryland. This provided title to exclusive fields of use for Patent Application Serial No. 09/391,605 entitled, "Differential Pressure Flow Sensor" invented by IHDIV employee, Michael Deeds, Code 4420E. Throughout FY02, Wickford Technologies commercialized this Navy developed technology as a result of a Maryland Technology Development Corporation (TEDCO) funded cooperative research and development agreement signed with IHDIV providing the technical assistance. The technology will be used for recreational sail or powerboats, recreational marine electronics, petroleum distribution, process pipe, and aviation electronics. Wickford Technologies, Inc. scheduled a public unveiling of the marine product, which is named the "Groove," at the U.S. Sailboat Show in Annapolis, Maryland October 10-14, 2002. The ORTA representative attended.

There are three partially exclusive patent licenses currently under negotiation and others in place that cannot be discussed in detail at this time due to the proprietary nature of the negotiations.

Twelve new cooperative research and development agreements (CRADAs) were signed in FY02. Currently, eight more are in the process of negotiation. This is an increase in the number of CRADAs under development from previous years. The following is a list of CRADAs signed in FY02:

**NON-STANDARD NCRADA-IHDNSWC-02-009 with Microsoft Corporation (MICROSOFT) entitled, “Research and Development of Software.”**

The objective of this agreement is to facilitate scientific collaboration between the professional staff at the IHDIV and MICROSOFT for the purpose of developing Microsoft SQL Server 2000 and Microsoft SQL Server 2000 Windows CE Edition applications for the Navy. IHDIV also plans to participate in Microsoft’s Joint Developer Program (“JDP”) to facilitate company’s deployment of Microsoft SQL Server 2000 and Microsoft SQL Server 2000 Windows CE Edition and to create helpful development feedback for Microsoft.

IHDIV has adapted and developed signature capture and verification software (using a Systems Developer’s Kit (SDK)) using hand held Pocket PC running Microsoft Server Navy developed work for DoD applications as well as in products intended for sale.

**NCRADA-IHDNSWC-02-001 with Alliant Techsystems, Inc. entitled, “Research and Development of Energetic Systems for Department of Defense Utilization.”**

The purpose of this Agreement is to facilitate scientific collaboration between the professional staffs at IHDIV and ATK for the purpose of testing, analyzing, and formulating energetics and energetic systems for use in Department of Defense-related applications. This Agreement serves to leverage the capabilities of both Parties to enable more rapid, in-depth research that could not be otherwise accomplished by either Party.

**NCRADA-IHDNSWC-02-007 with General Dynamics, Ordnance and Tactical Systems (GD-OTS) entitled, “Research and Development of Non-Lethal Vessel Capture System.”**

The technical objective of this CRADA is to conduct research leading to the development of a non-lethal system to capture and control surface vessels. This concept is being developed to provide a successful and accurate method for delivering net payloads over target vessels, facilitating capture and control and allowing subsequent boarding. The system is intended for use by government agencies.

**NCRADA-IHDNSWC-02-011 with Galaxy Aviation Security, LLC (GALAXY) entitled, “Research into the Application of Blast Mitigation and Containment Technologies for the Packaging and Stowage of Ammunition and Explosives.”**

The primary objective of this CRADA between IHDIV DETACHMENT EARLE and GALAXY is to facilitate research and development of materials and structures that can be used in the packaging and stowage of A&E to reduce the risk associated with unintentional initiation/explosion. This research could result in significant improvements for the military in the procedures required to transport and stow A&E. These improvements would be a result of a reduction in the hazard class of the A&E and a change in segregation compatibility requirements due to the unique packaging concepts and shipboard stowage structures developed under this agreement. It is expected that IHDIV DETACHMENT EARLE can apply the results of this research to existing and future A&E packaging and shipboard structures to improve shipboard stowage issues and to reduce the cost of operations and transportation of A&E. It is anticipated that GALAXY can use the results of this research to enhance the utilization of blast-hardened containers for use in civilian/commercial applications for security and protection.

**NCRADA-IHDNSWC-02-012 with Virginia Advanced Shipbuilding and Carrier Integration Center (Facility of Newport News Shipbuilding and Drydock Company) entitled, “Development of Knowledge Engineering Management Applications Promoting Excellence For Shipbuilding.”**

The primary goal of this CRADA is to support VASCIC as the world-class center of excellence for shipbuilding. Included in the objectives of this collaboration are the following:

- Research on information engines, which promote process improvement evolutions to existing product end items
- Research and development for future software tools to define optimum human/machine interface options
- Research on design options for electric ship technologies
- Research for design of future weapons handling processes and knowledge handling tools
- Content development for integration of information technology
- Data mining software tools for capturing relevant information into data domains
- Development of job performance technologies
- Design and implementation of knowledge capturing/sharing technologies
- Research and options for communications solutions
- Research, design, and development of advanced solutions (Campus of the Future)
- Research, development, and options for shipboard design
- Research, development, and options for shipboard systems and subsystems

- Test and evaluation of knowledge engineering products
- Research, design, and options to promote Fleet connectivity

**NCRADA-IHDNSWC-02-015 with Schlumberger Technology Corporation (STC) entitled, “Research and Development of Explosive Formulations, Shaped Charges and Initiation.”**

The purpose of this agreement is to facilitate scientific collaboration between the professional staffs at IHDIV and STC for the purpose of developing pressed main-charge and booster explosives, high temperature explosives, explosives and formulations suitable for slapper detonators, and high temperature propellants and pyrotechnics. IHDIV’s mission includes responsibility for the development of explosives and explosive charges for Navy applications, including high temperature explosive requirements for specific missile warheads, and developing shaped charge designs. STC has advanced experience in developing high temperature explosive formulations, is a leader in advanced shaped charge development, and develops explosive molding powders and explosive shaped charges for commercial applications such as oil field exploration and development, as well as perforation of coal and gas field bases. STC also has advanced manufacturing production expertise, which will be shared with, and is of great value, to the Navy. IHDIV and STC will use this CRADA as a means for openly exchanging information and for further development of explosives for their respective uses.

**NCRADA-IHDNSWC-02-017 with Virginia State University (VSU) entitled, ”Development of Virtual Campus for Long-Life Learning Applications Directed Toward the Future Workforce”**

The primary objective of this CRADA is to support VSU as a Virtual Campus for life-long learning applications. Included in the objective of this collaboration are the following:

- Research and development for future software tools to define optimum human/machine interface options
- Content development for integration of information technology
- Data mining software tools for capturing relevant information into data domains
- Design and implementation of knowledge capturing/sharing technologies
- Development of virtual campus options for minorities and the disadvantaged
- Research and development of options for basic science and engineering at junior and senior high school level

- Testing and evaluation of knowledge engineering products.

**NCRADA-IHDNSWC-02-020 with Envision Product Design, LLC. (ENVISION) entitled, “Development of Hand-held Portable X-Ray Device Applications.”**

The objective of this agreement is to facilitate scientific collaboration between the professional staff at IHDIV, Detachment Seal Beach and ENVISION. The device is described as a “Hand-held Portable X-Ray Device for Shipboard Non-Destructive Inspections (NDI)”- a COTS available technology.” The hand-held portable x-ray device for shipboard NDI and testing has the potential to be used for in-situ (at sea, in-place) inspections. The device can operate with minimal disruption to shipboard activities (exposure distance is less than 10 feet).

IHDIV, Detachment Seal Beach, will be participating in testing this technology for various shipboard applications, which include the following: imaging clogged pipes and corrosion under heavy terrazzo tiling, inspecting rigid coax cable, checking for corrosion on conduit end fittings and ground adapters without removing coldshrink, detecting flaws in composite structures, inspecting electrical surge protectors, inspecting lightning arrestor connectors (LACS), inspecting the integrity of heavy piping connected to boilers. The Navy will test various applications of the technology and provide test results to ENVISION whereby ENVISION may modify and improve the devices.

**NCRADA-IHDNSWC-02-022 with DDK Technology Group, Inc. (DDK) entitled, ”Research and Development of Improvised Explosive Component Database for Combating Terrorism.”**

The objective is to fulfill a requirement from the NAVSEA Combating Terrorism Technology Support Office and Technical Support Working Group. The design and development of the Improvised Explosive Component Database (IED) will contribute to the Investigative Support and Forensic (IS) Mission/Area Subgroup. This subgroup is responsible for identifying and developing user requirements and associated technologies, equipment and solutions that improve current or provide new forensic capabilities for analyzing terrorist-related evidence and technology for supporting terrorist-related investigations.

**NCRADA-IHDNSWC-02-027 with L3 Communications, Ocean Systems (L-3OS) entitled, “Applied Research and Development Relating to an Airborne Mine Neutralization System (AMNS).”**

The objective of this CRADA is to integrate technologies in the underwater sound signal and sonobuoy (SUS/Sonobuoy) domain with the

underwater warhead (UWWHD) domain and to apply the integrated technology to AMNS. This CRADA is to transfer technology from IHDIV to L-3OS for the purpose of developing new AMNS capability for the Department of Defense (DOD) and other government and commercial clients to jointly solve insensitive munitions issues. IHDIV would provide engineering design, explosive loading techniques, testing & evaluation, facility support through the use of their current capabilities and expertise in regard to SUS and UWWHD. L-3OS will supply AMNS system requirements, engineering design and system hardware.

**NCRADA-IHDNSWC-02-035 with Technanogy, LLC (TECHNANOLOGY) entitled, “Development of Applications for Nanomaterial in Energetics.”**

The purpose of this agreement is to facilitate scientific collaboration between the professional staffs at IHDIV and TECHNANOLOGY for the purpose of testing, analyzing, and formulating energetics containing nano-sized aluminum particles for use in Department of Defense-related applications. This agreement serves to leverage the capabilities of both parties to enable more rapid, in-depth research that could not be otherwise accomplished by either party separately.

IHDIV is considered the Navy’s Center of Excellence for Energetics development and has extensive expertise, capabilities, and information in energetics synthesis, formulation, and processing as well as in testing of energetic systems. IHDIV will transfer their knowledge of development and manufacturing energetics with respect to the use of TECHNANOLOGY produced nanoaluminum and supply TECHNANOLOGY with test data associated with the testing of TECHNANOLOGY nanoaluminum.

TECHNANOLOGY is a leader in the production of nanoaluminum for use in energetic systems utilized for DoD purposes. To our knowledge, TECHNANOLOGY is the sole supplier of nanoaluminum for use in pilot scale processing. TECHNANOLOGY will share their material and knowledge of nanoaluminum processing subject to the terms and conditions of this CRADA.

**NCRADA-IHDNSWC-02-037 with John Hopkins Bloomberg School of Public Health entitled, “Assessment of Exposure and Protection on Dermal Hazards in the Workplace**

The objective of this CRADA is to analyze potential dermal exposure at IHDIV, as well as in various industries. This objective includes quantitatively assessing the potential for worker dermal exposure and evaluating the current practice of controls, including the use of personal protective equipment. The intent of this collaboration is to provide a basis

for future studies regarding dermal hazards in the workplace, their effects, and factors needed to control such exposure.

In FY02, the United States Patent and Trademark Office (USPTO) issued a record number of 39 patents to IHDIV listed as follows:

**6,298,763** entitled, “Explosive Device Neutralization System” by inventor(s): Gary R. Greenfield, Brian D. Peterson, Paul R. Gefken, Terry Henry, Steven Kirkpatrick

**6,299,711** entitled, “Gas-Generating Liquid Compositions (OX SOL 3)” by inventor(s): Kerry Wagaman

**6,301,970** entitled, “Cumulative Damage Model For Structural Analysis of Filled Polymeric Materials” by inventor(s): Gary L. Biggs, John J. Nestor

**6,308,581** entitled, “Differential Pressure Flow Sensor” by inventor(s): Michael A. Deeds

**6,308,631** entitled, “MEMS Vertical To Horizontal Motion Translation Device” by inventor(s): Gabriel L. Smith, Lawrence Fan

**6,312,629** entitled, “Apparatus And Method For Pressing Powder” by inventor(s): James A. Gusack, Mark D. Lowell, Phillip Kneisl

**6,317,482** entitled, “Radiological Image Quality Indicator” by inventor(s): Eugene J. Stefko

**6,321,656** entitled, “Thermally Actuated Release Mechanism” by inventor(s): Randolph T. Johnson

**6,324,957** entitled, “Detonating Cord Stowage System,” by inventor(s): John E. Hendershot, John P. Murphy, John R. Luense

**6,325,876** entitled, “Energetic Plasticizers Containing 3,3-Bis(Difluoroamino)-1,5-Dinitratopentane and Method of Preparation” by inventor(s): Horst G. Adolph, Nirupam J. Trivedi

**6,328,831** entitled, “Gas-Generating Liquid Compositions (Perhan)” by inventor(s): Kerry L. Wagaman

**6,331,220** entitled, “Gas-Generating Liquid Compositions (Persol 2)” by inventor(s): Kerry L. Wagaman

**6,332,389** entitled, “Manual Die Set For Pressing Explosive Powder into Hardware” by inventor(s): Phillip S. Ham



**6,338,242** entitled,” Vented MK66 Rocket Motor Tube With A Thermoplastic Warhead Adapter” by inventor(s): Steven S. Kim, John R. Luense

**6,345,577** entitled, “Energetic Deterrent Coating For Gun Propellant” by inventor(s): Randall J. Cramer, Susan Peters, Ronald Simmons, Steve Mitchell

**6,346,987** entitled, “Micro-Optical Position Indicator” by inventor(s): Paul J. Smith, Steven S. Lee

**6,349,474** entitled, “Cable Cutter” by inventor(s): Bruce D. Jordan

**6,352,029** entitled, “Thermally Actuated Release Mechanism” by inventor(s): Raafat H. Guirguis, John Kelley

**6,354,075** entitled, “Vented Rocket Motor Spacer” by inventor(s): Johnson, Armstrong, Dulcey

**6,354,137** entitled, “Inertial Confinement Cylinder For Explosive Characterization” by inventor(s): Guirguis, Sandusky, Chambers

**6,363,828** entitled, “Shock Driven Projectile Device” by inventor(s): Mary Hilker Sherlock, Edward A. Lustig, Jr., Edward Delaney, Richard I. Gold, Steven Segletes

**6,363,855** entitled, “Solid Propellant Rocket Motor Thermally Initiated Venting Device” by inventor(s): Steven S. Kim, Chris M. Nugent

**6,364,601** entitled, “Straddle Type Container Lifting Device” by inventor(s): Joseph F. Picarello, Charles A. Domino

**6,371,200** entitled, “Perforated Heat Sink” by inventor(s): Deran S. Eaton

**6,374,739** entitled, “Lockable Electro-optical High Voltage Apparatus and Method for Slapper Detonators” by inventor(s): Smith, Litcher

**6,379,104** entitled, “Single Side Entry Container Lifting Device” by inventor(s): Charles A. Domino, Joseph F. Picarello

**6,381,894** entitled, “Bola Launcher” by inventor(s) John P. Murphy

**6,382,104** entitled, “Two-Piece Pad Igniter Bag” by inventor(s): Susan T. Peters

**6,395,112** entitled, “Hydrolyzable Polymers for Explosive and Propellant Binders” by inventor(s): Sitzmann, Adolph

**6,395,859** entitled, “Hydrolyzable Energetic Thermoplastic Elastomers and Methods of Preparation Thereof” by inventor(s): Stern, Adolph

**6,401,591** entitled, “Neutralization Chemical Injection Penetrator” by inventor(s): Jonathan R. Ross

**6,402,864** entitled, “Low Slag, Reduced Hazard, High Temperature Incendiary” by inventor(s): Gill, Gotzmer, Carpenter, Schlegel

**6,409,854** entitled, “Incendiary Composition” by inventor(s): Robert C. Gill, Carl Gotzmer, Pamela Carpenter, Eric Schlegel<sup>20</sup>

**6,423,844** entitled, “Process for Making 1,2,4-Triazolo[4,3-A][1,3,5]Triazine-3,5,7-Triamine” by inventor(s): Koppes, Sitzmann

**6,431,072** entitled, “Propellant Grain Configuration” by inventor(s): Harry L. Archer, Jr.

**6,439,099** entitled, “Explosive Charges Braided into a Line Charge Assembly” by inventor(s): Carlson, Furr, Grande, Luense

**6,439,119** entitled, “Lockable Electro-Optical High Voltage Apparatus for Slapper Detonations” by inventor(s): Paul J. Smith

**6,450,443** entitled, “High Torque 2.75-Inch Rocket Nozzle” by inventor(s): Steven S. Kim

IHDIV received two statutory invention registrations:

**H2038** entitled, “Cartridge Actuated Ordnance Filter” by inventor(s): Nial, DeLeon, Kaloterakis, Kang

**H2039** entitled, “Clearing Obstacles” by inventor(s): Holt, Rozner, Howder

Information regarding the above inventions may be found on the technology transfer website at <http://www.ih.navy.mil/ttrans/>. To keep abreast of the fundamental shift from serving local markets through a physical presence to reaching global markets through a virtual presence, the technology transfer website was completed in FY02. In accordance to the mission of the IHDIV Technology Transfer Program, this website will prove to be a valuable tool in promoting the facilities, expertise, and technologies available at Indian Head. Visitors worldwide also can utilize

this website to acquire the information necessary for establishing partnerships and/or agreements with IHDIV. The ORTA will be responsible for updating the website and measuring its success partly by tracking the number of visitors.

#### ▪ **Key Lessons Learned**

Contracting out invention disclosures for completion of prior art searches and patent applications is both an expedient and fiscally sound method of doing business.

Marketplace software is a significantly cheaper version of Dunn and Bradstreet, which works well for identifying potential licensees.

Attending one or two major trade shows may be very beneficial in developing a laboratory's professional image and creating future collaborations/partnerships.

### **3.0 Strategic Five-Year Goals**

#### Training:

An important aspect of NSWC IHDIV's technology transfer program is training. The training content will vary according to the intended audience. All lab personnel involved in the research, development, evaluation, and management of technical programs are included as the intended audience. The ORTA Representative, legal counsel, patent attorney, and experts from outside the laboratory will conduct the training. At the end of 5 years, the goal is for at least 95% of the scientists and engineers as well as lab management to have received technology transfer training and to be knowledgeable in the latest transfer mechanisms and procedures.

The ORTA Representative will continue to receive more intense technology transfer training. This is important because the ORTA Representative solely mans the Technology Transfer Office at NSWC IHDIV. It is a goal that the ORTA Representative will have received training in the latest technology transfer programs on an annual basis. The ORTA Representative will maintain proficiency through reading various publications on topics such as the latest legislative initiatives, technology transfer mechanisms, intellectual property protection, cooperative research and development agreements, and patent licensing and by attending training seminars as appropriate.

#### Identifying available technologies:

A laboratory technology market assessment process has been developed that utilizes outside resources. First, the ORTA Representative selects available technologies that appear to have commercial potential. Experts in these technologies are consulted along with the ORTA Representative to consider the technology's attributes. Usually, the following attributes are considered: (1) technology strengths, (2) technology weaknesses, (3) ease of replication, (4) commercial applications, (5) commercial strengths, (6) commercial weaknesses, (7) market sales potential, (8) government (DoD) financial benefits. Based upon the results of this comparative analysis, technologies are chosen which have the greatest potential for successful transfer.

Assessments for those technologies that have not been transferred need to be reassessed for currency. Over the next 5 years, emphasis will be placed on transferring those technologies that have high market value rather than doing new assessments. It is estimated that approximately 80% of the laboratory's technologies have had at least a preliminary assessment. It is the goal of the ORTA to have the scientists and engineers, with proper training, to routinely identify the technologies that warrant assessment as they prepare for program review while writing invention disclosures.

Several non-profit commercial assessment organizations, including Unisphere Corp, VA and Tech Link, MT, have been contacted and provided access to the IHDIV patent/patent application portfolio. It is expected that the assessments will lead to successful licensing of IHDIV technologies.

## **4.0 One-Year Objectives**

### **4.1 Reporting/Management Information**

All scientific and technical personnel at NSWC IHDIV have the responsibility for technology transfer. However, the primary office within Indian Head Division for the initiation, facilitation, and implementation of the laboratory's technology transfer activities is the Office of Research and Technology Applications (ORTA). In accordance with the Federal Technology Transfer Act of 1986 (Public Law 99-502), as well as with law HR 209, the primary functions of the IHDIV ORTA are as follows:

1. to conduct assessments of laboratory resources and technologies, including intellectual property, which may have potential commercial applications;
2. to provide and disseminate information on laboratory owned or originated materials, processes, and services having potential application to private industry, as well as to state and local governments;
3. to cooperate with and assist the Federal Laboratory Consortium for Technology Transfer, the regional technology transfer centers, and

other organizations that link the research and development resources of IHDIV and the federal government to potential users in state and local governments and private industry;

4. to provide technical assistance to state and local government officials;
5. to participate in regional, state, and local programs designed to facilitate or stimulate the transfer of technology for the benefit of the region or state.

- **The Year Ahead - Implications for Goals, Objectives and Strategies**

- Actively promote laboratory technologies and resources
- Actively promote partnership opportunities
- Maximize technology transfer awareness in-house
- Provide training to lab personnel in technology transfer
- Provide technology transfer guidelines
- Enhance dual-use potential of laboratory technologies
- Maximize protection of intellectual property
- Communicate success of technology transfer activities at annual IHDIV program reviews
- Implement proposed technology transfer budget

## **4.2 Marketing and Outreach**

The marketing objective will include not only those technologies identified as having high commercial potential in the market assessment process but also other lab resources, such as unique facilities, specialized equipment, and in-house expertise. Executive summaries for all technologies where a commercial potential is perceived will be provided to various technology transfer publications (i.e., FLC NewsLink, Federal Technology Report, Technology Access Report, Technology Transfer Business magazine) and publicized in the local lab newspaper and Command highlights. The lab's technologies and resources will also be maintained on the NSWC IHDIV's home page under technology and business opportunities.

In addition to publications and electronic media, the ORTA will participate in trade shows and symposiums promoting the lab's technologies and resources. After each event, the ORTA will assess the quality of technology transfer leads to determine the following years participation at the particular event.

## **4.3 Internal Relations**

Technology Transfer is funded through the IHDIV Technology Investment Program (TIP). This program directly funds research projects with perceived substantial payoff.

#### **4.4 External Relations (Intermediaries and Commercial)**

- Participation as member of Maryland Business and Economic Development Council
- Serve as Deputy Regional Coordinator for FLC Mid-Atlantic Region
- Support the development of small business in the state of Maryland through participation with TEDCO
- Serve as chairman of NSWC Dual Use Leaders Group

### **5.0 Resources**

#### **5.1 Human Resources**

The ORTA provides training to IHDIV scientists and engineers on an annual basis in cooperative agreements, intellectual property, and some aspect of technology transfer. The ORTA also attends seminars/workshops related to all aspects of technology transfer.

Support for Education and Training: \$2,000

Position Description Statements:

The ORTA is responsible for the NSWC IHDIV Technology Transfer Program. This program has specific efforts in the following:

- Training S&E's as well as program managers
- Identification of laboratory technologies
- Marketing technologies, facilities, and expertise
- Interacting and outreaching with potential non-Navy partners
- Negotiating and signing formal cooperative tech transfer agreements
- Post transfer administration
- Maintaining intellectual property database
- Laboratory Tech Transfer Homepage
- FLC, DULG, NTTC involvement among others
- IR&D POC for IHDIV

#### **5.2 Financial Management**

Salaries:

Burdened salary for technology \$100,000

Patent/Other Income (FY01):

Royalty income from patent licenses	\$26,000
CRADA income	\$536,000

Distribution of Royalty Income:

Other T2 Expenses:

Travel (to meetings, workshops, etc.)	\$8,000
Patent Attorney fees	\$26,000
Patent Maintenance fees	\$12,000
Display Materials/Brochures	\$2,000

### **5.3 Facilities and Equipment**

Implementation of 10 U.S.C. 2539b allows IHDIV to make available to non-Navy entities a full spectrum of capabilities, including research, development, testing, engineering, acquisition, manufacturing, industrial base, fleet, and operational support for these technologies:

- Microelectromechanical Systems (MEMS)
- Lifecycle Environmental Solutions
- Novel Specialty Chemicals
- Specialized Research Capabilities
- Energetic Materials (including propellants for airbags, fireworks, flares)
- Twin Screw Processing of Highly-Solids-Filled Materials
- Manufacturing Technology
- Information Engineering
- Packaging, Handling, Storage, and Transportation
- Center for Applied Analytical Technologies
- Production of Nano Materials
- Specialty Tool, Die, and Mold Equipment
- Combustion Engineering (Solid State High Temperature Synthesis)
- High Strength Composites
- High Energy, High Reliability, Miniaturized Actuators

A brand new facility for the development of micro electro-mechanical systems (MEMS) technology was opened during the previous fiscal year. This facility is being utilized to develop mechanical devices for placement on computer chips, as well as other computer components. Experts in the field also are available for providing consultation.

This laboratory may also provide technical expertise for special weapons, explosive safety, and ordnance environmental support. Our technical

capabilities and expertise support all Naval warfare areas, as well as Army, Air Force, Marine Corps, and the private sector.

NSWC IHDIV also has expertise and facilities for synthesis and processing of materials in using carbon dioxide in its liquid and supercritical (L-CO<sub>2</sub>/SC-CO<sub>2</sub>) states as a reaction solvent. This process provides a flexible, low temperature technique for producing highly loaded polymer materials. SC technology also provided environmental technology benefits, including pollution prevention.

The Lab's Center for Applied Analytical Technologies is a recognized leader in the area of characterization and analysis of materials. The following are some of the capabilities provided:

- Fourier Transform Infra Red (FTIR)
- Scanning Electron Microscopy (SEM)
- X-ray Diffraction (XRD) Analyzer
- Nuclear Magnetic Resonance (NMR)
- Accelerated Rate Calorimeter (ARC)
- Inductively Coupled Argon Plasma (ICP)
- Graphite Furnace Atomic Absorption (GFAA)
- Gas Chromatography/Mass Spectroscopy
- Supercritical Fluid Extraction/Chromatography (SFE/SEC)
- Liquid Chromatography (LC)
- Capillary Electrophoresis (CE)

A state-of-the-art continuous processing capability is available for continuous extrusion filled polymeric compositions. Experts in the field also are available for consultation.

A brand new facility to manufacture propellant actuated devices is available for exploitation. The expertise available in the design and manufacture of cartridge and propellant actuated devices is world class.

Numerous existing unique capabilities also are available at NSWC IHDIV. For information about these capabilities, contact the ORTA Representative, Dr. J. Scott Deiter, via the Technology Transfer Web Page: <http://www.ih.navy.mil/ttrans/>

## **6.0 Performance Measures**

Technology transfer occurs because it is good for the U.S. public. The Navy does not have a specific quantitative ROI. There is no specified "quid pro quo" either. There are criteria, however, by which potential technology transfer ventures are examined. Each potential transaction is examined to determine in what ways the Navy, and the mission it is charged with executing, will benefit.



The savings benefit to NSW IHDIV associated with leveraging resources for research and development conducted under active CRADAs during FY02 significantly exceeds \$750,000. These savings are projected to rapidly rise as the number of CRADAs continues to increase.